UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/776,248	02/12/2004	Toshiaki Otsuki	392.1872	4162

21171	7590	11/29/2006

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EXAMINER
CABRERA, ZOILA E

ART UNIT	PAPER NUMBER
2125	

DATE MAILED: 11/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 September 2006*.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All b)☐ Some * c)☐ None of:

        1.☒ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .
5)☐ Notice of Informal Patent Application
6)☐ Other: _____.

DETAILED ACTION

Final Rejection

1.   The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

The rejection with respect to claims 1-12 is maintained.

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2, 5-9 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by **Coleman et al. (US 6,909,517)**.

1. A numerical control device for controlling a machine having an axis of linear motion and at least one axis of rotation on a tool head **or** a table (Figs. 1-2, 13A; Col. 1, lines 15-23), said numerical control device comprising: means for obtaining a machine position to which the machine should actually move so that the relation between a workpiece and a tool that is found when there is no mechanical error is maintained (Col. 4, lines 9-20) on the basis of a reference position at which there is no mechanical error

in the axis of rotation and an amount of misalignment of the actual axis of rotation from

the reference position (Col. 5, lines 58-61; Col. 6, lines 11-52; Col. 15, line 55- Col. 16,

line 16), **and/or** on the basis of a reference position at which there is no mechanical

error in the turning center of the spindle and an amount of misalignment of the actual

turning center of the spindle from the reference position of the turning center of the

spindle (Col. 14, lines 29-48; Fig. 4; Fig. 8; Col. 15, lines 41-47); and drive control

means for driving the axis of rotation and the axis of linear motion to the machine

position obtained by said machine position obtaining means (Col. 12, lines 27-31; Col.

15, lines 55 to Col. 16, line 16).

2. The numerical control device according to claim 1, wherein said tool head of the

machine rotates about at least one axis (Col. 15, lines 59-61).

5. The numerical control device according to claim 1, wherein said amount of

misalignment is set by a parameter in the numerical control device (Col. 16, lines 10-

16).

6. The numerical control device according to claim 1, wherein the amount of

misalignment is delivered to the numerical control device by a signal from the machine

to the numerical control device (Col. 17, lines 33-44).

7. The numerical control device according to claim 1, wherein the amount of misalignment is delivered to the numerical control device by a signal from external equipment to the numerical control device (Col. 13, lines 10-15).

As for claim 8, the same citations applied to claim 1 above apply as well for this claim.

9. The numerical control method according to claim 8, wherein the tool head of the machine rotates about at least one axis, and said method further comprising the steps of: correcting the tool length vector on the basis of a reference position at which there is no mechanical error in the axis of rotation and an amount of misalignment of the actual axis of rotation from the reference position (Col. 14, line 57- Col. 15, line 32, please note that the claim is in the alternative, therefore, only one is needed), **and/or** a reference position at which there is no mechanical error in the turning center of the spindle, an amount of misalignment of the actual turning center of the spindle from the reference position of the turning center of the spindle, and instruction for the axis of rotation, and adding the instruction position vector to the corrected tool length vector and obtaining the machine position (Col. 15, lines 23-25).

As for claim 12, the same citations applied to claims 5-7 above apply as well for this claim.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of

the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g)

prior art under 35 U.S.C. 103(a).

Claims 3-4 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable

over **Coleman et al. (US 6,909,517)** in view of **Bohez**, "Compensating for systematic

errors in 5-axis NC machining".

Coleman discloses the limitations of claims 1and 8 above but fails to specifically

disclose the limitations of claims 3-4 and 10-11. However, Boehz discloses such

limitations as follows:

3. The numerical control device according to claim 1, wherein said table of the machine

rotates about at least one axis (Pages 393-394, Figs. 3-4).

4. The numerical control device according to claim 1, wherein said machine has the tool head and the table which rotate (Pages 393-394, Figs. 3-4).

10. The numerical control method according to claim 8, wherein the table of the machine rotates about at least one axis, said method further comprising the steps of: adding an offset of the origin of a table coordinate system to an instruction position in an table coordinate system and thereby obtaining an instruction position in the machine coordinate system (Page 393, Section 4); and correcting misalignment of the instruction position in the machine coordinate system on the basis of a reference position at which there is no mechanical error in the axis of rotation, an amount of misalignment of the actual axis of rotation from the reference position, and the instruction position for the axis of rotation, obtaining a position where the axis of rotation has rotated to the rotation position according to the instruction, and adding a tool length vector to the position to obtain the machine position (Page 394, left column).

11. The numerical control method according to claim 8, wherein said machine has the tool head and table which rotate, said method comprising the steps of: adding an offset of the origin of a table coordinate system to a position instruction in the table coordinate system and thereby obtaining an instruction position in a machine coordinate system; obtaining an instruction position for which the misalignment has been corrected on the basis of an amount of misalignment of the actual axis of rotation provided to the table

from a reference position at which there is no mechanical error in the axis of rotation

and an instruction position for the axis of rotation; obtaining an actual tool length vector

of the tool for which misalignment has been corrected on the basis of an amount of

misalignment of the actual axis of rotation provided to the tool head from a reference

position at which there is no mechanical error in an axis of rotation and the instruction

position of the axis of rotation, in addition to a tool length vector; and obtaining a

machine position from the instruction position for which the misalignment has been

corrected and the actual tool length vector of the tool for which the misalignment has

been corrected (Pages 393-394, Section 4);.

Therefore, it would have been obvious to a person of the ordinary skill in the art

at the time the invention was made to combine the teachings of **Coleman** with the

teachings of **Bohez** because it would provide an improved system for compensating

errors and thereby achieving higher performance (Bohez, Abstract) in a 5 axis NC

machine that includes a tool head and a table.

Response to Arguments

4.   Applicant's arguments filed 9/13/06 have been fully considered but they are not

persuasive.

Applicant contends, Pages, 6-7, that Coleman does not disclose or suggest:

means for obtaining a machine position to which the machine should actually move so

that the relation between a workpiece and a tool that is found when there is no

mechanical error is maintained on the basis of a reference position at which there is no

mechanical error in the axis of rotation and an amount of misalignment of the actual axis

of rotation from the reference position, **and/or** on the basis of a reference position at

which there is no mechanical error in the turning center of the spindle and an amount of

misalignment of the actual turning center of the spindle from the reference position of

the turning center of the spindle. Examiner disagrees because Coleman discloses such

limitations (Please note that the claim is in the alternative and it requires only one of the

two options), i.e., means for obtaining a machine position to which the machine should

actually move so that the relation between a workpiece and a tool that is found when

there is no mechanical error is maintained (Col. 4, lines 9-20) on the basis of a

reference position at which there is no mechanical error in the axis of rotation and an

amount of misalignment of the actual axis of rotation from the reference position (Col. 5,

lines 58-61; Col. 6, lines 11-52; Col. 15, line 55- Col. 16, line 16).

In response to applicant's argument that the references fail to show certain

features of applicant's invention, it is noted that the features upon which applicant relies

(i.e., controlling the mechanical error that might exist in an axis of rotation of the

machine and/or the mechanical error that might exist in the turning center of the spindle

of the machine) are not recited in the rejected claim(s). Although the claims are

interpreted in light of the specification, limitations from the specification are not read into

the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant further argues that Coleman does not attempt to maintain the accuracy

of a machine in relation to a workpiece of the machine and that Coleman seeks to

qualify the accuracy of a machine only with respect to a fixed monument that is separate from that of the machine. Examiner disagrees because Coleman discloses that his invention involves making regular periodic checks of the machine positioning accuracy and the relationship between the machine and the workpiece holding fixture (Col. 3, lines 29-35). Coleman further discloses that the checks with the probe against the monument are useful for detecting certain probe-caused errors and machine-caused errors that may result in parts being produced out of tolerance (Col. 4, lines 21-24).

Applicant argues that Coleman does not discuss or suggest "drive control means for driving the axis of rotation and the axis of linear motion to the machine position obtained by said machine positioning obtaining means". Examiner disagrees because Coleman teaches such limitations (Col. 12, lines 27-31; Col. 15, lines 55 to Col. 16, line 16).

Conclusion

5.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of
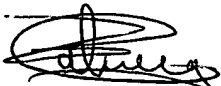
the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning communication or earlier communication from the examiner should be directed to Zoila Cabrera, whose telephone number is (571) 272-3738. The examiner can normally be reached on M-F from 8:00 a.m. to 5:30 p.m. EST (every other Friday).

If attempts to reach the examiner by phone fail, the examiner's supervisor, Leo Picard, can be reached on (571) 272-3749. Additionally, the fax phones for Art Unit 2125 are (571) 273-8300. Any inquiry of a general nature or relating to the status of this application should be directed to the group receptionist at (703) 305-9600.

Zoila Cabrera
Primary Examiner
11/22/06

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